

CLAIMS

1. Light-emitting diode arrangement having:
 - at least one light-emitting diode chip (1)
 - a multi-layer board (17) having a base (5) of a thermally well conducting material, in particular of metal, and
 - an electrically insulating and thermally conducting connection layer (2) between the emission surface of the light-emitting diode chips (1) and the board.
2. Arrangement according to claim 1, characterized in that, the electrically insulating connection layer (2) is at least the boundary surface (15) of the light-emitting diode chip (1) which is towards the board (17)
3. Arrangement according to claim 1 or 2, characterized in that, the electrically insulating connection layer is at least an adhesive layer (2).
4. Arrangement, in particular in accordance with any preceding claim, characterized in that, the light-emitting diode chip (1) is accommodated in a depression (16) of the board (17).
5. Arrangement according to any preceding claim, characterized in that, the light-emitting diode chip (1) is arranged in the region of a depression (12) in the base material (5) of the board (17).
6. Arrangement according to claim 4 or 5,

characterized in that,
the light-emitting diode chip (1) does not project
beyond the contour of the board (17).

5 7. Arrangement according to any of claims 4 to 6,
characterized in that,
the light-emitting diode chip (1) ends plane with
the upper side of the board (17).

10 8. Arrangement according to any of claims 4 to 6,
characterized in that,
the depression (12, 16) has the function of the
reflector.

15 9. Arrangement according to any of claims 4 to 8,
characterized in that,
the walls of the depression (12, 16) are at least
partially bevelled.

20 10. Arrangement according to any preceding claim,
characterized in that,
the light-emitting diode chip (1) is so arranged
that the substrate of the light-emitting diodes is
towards the plate (17).

25 11. Arrangement according to claim 10,
characterized in that,
the substrate of the light-emitting diodes is of an
electrically insulating material.

30 12. Arrangement according to claim 11,
characterized in that,
the substrate of the light-emitting diodes is of
sapphire.

35 13. Arrangement according to any of claims 1 to 19,
characterized in that,

the light-emitting diode chip (1) is so arranged that the substrate of the light-emitting diodes is away from the board (5).

- 5 14. Arrangement according to claim 13,
characterized in that,
between the light-emitting diode chip (1) and the
board (17) there is arranged an intermediate carrier
10 (10) which is separate from those parts, with which
intermediate carrier the light-emitting diode chip
(1) is electrically contacted.
15. Arrangement according to claim 14,
characterized in that,
15 the intermediate carrier (10) is formed by an
aluminium nitride substrate.
16. Arrangement according to claim 14 or 15,
characterized in that,
20 the side of the intermediate carrier (10) towards
the board (17) is electrically insulating.
17. Arrangement according to claim 16,
characterized in that,
25 the region of the intermediate carrier (10) towards
the light-emitting diode chip (1) has conductive
regions.
18. Arrangement according to any preceding claim,
30 characterized in that,
at least the region of the light-emitting diode chip
(1) is covered by a lens (6), in particular a
Fresnel lens (9).
- 35 19. Arrangement according to claim 18,
characterized in that,

the region between the board (17) and the lens (6, 9) is at least partially filled by a colour conversion material (13).

5 20. Arrangement according to any preceding claim, characterized in that,
the light emitting diode chip (1) is contacted by a circuit board (3) by means of wires (11), which circuit board is applied to the board (17) sandwich-like by means of an insulating layer (4) lying therebetween.

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21. Light-emitting diode arrangement, having,
- a multi-layer board (17), having at least a thermally well conducting layer (5), an electrically insulating layer (4) and a circuit board (3), wherein the electrically insulating layer (4) and the circuit board (3) in each case have at least one recess (12, 16) in which the thermally conductive layer (5) is thus exposed, and
- at least one light-emitting diode chip (1) which is put in place in the region of the recess (16) on the thermally well conducting layer (5).

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25 22. Light-emitting diode according to claim 21, characterized in that,
the light-emitting diode chip (1) is electrically contacted from the circuit board (3).

30 23. Light emitting diode arrangement according to claim 21 or 22, characterized in that,
between the emission area of the light-emitting diode chip (1) and the thermally well conduction layer (5) there is provided a thermally conducting connection layer (2).

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24. Light-emitting diode arrangement according to claim 23,
characterized in that,
the surface of the light-emitting diode chip (1) towards the thermally well conducting layer (5) is electrically conductive,
wherein the connection layer (2) is a separate, electrically insulating layer.

10 25. Light-emitting diode arrangement according to claim 24,
characterized in that,
the electrically insulating layer is formed by means of an adhesive foil.

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